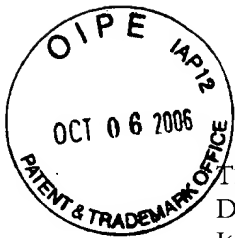


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October 2, 2006

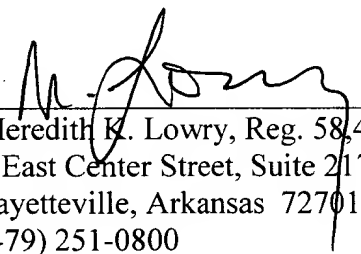
Mail Stop Appeal Briefs – Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to Office Action of September 21, 2006, please find the enclosed  
Complete Appeal Brief with the amended headings.

Respectfully submitted,

KEISLING PIEPER & SCOTT PLC

  
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Docket No. 016144  
Customer No. 30,767



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Woolley Brunson

Appl. No. : 09/844,526

Confirmation No.: 3732

Filed: : 4/27/01

TC/A.U. : 1742

Examiner : Ip, Sikyin

APPELLANT'S BRIEF  
(37 C.F.R. § 41.37)

Mail Stop Appeal Briefs – Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on November 21, 2005.

The fees required under § 1.17 and § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF. Appellant does not request an oral hearing.

This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. § 41.37(c)):

- I. REAL PARTY INTEREST
- II. RELATED APPEALS AND INTERFERENCES
- III. STATUS OF CLAIMS
- IV. STATUS OF AMENDMENTS
- V. SUMMARY OF INVENTION

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

VII. ARGUMENTS

A. REJECTIONS UNDER 35 U.S.C. § 112 (37 C.F.R. § 41.37(c)(1)(vii))

B. REJECTIONS UNDER 35 U.S.C. § 103

C. SUMMARY ARGUING PATENTABILITY OF ALL CLAIMS

VIII. APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

IX. APPENDIX OF EVIDENCE INVOLVED IN APPEAL

X. RELATED PROCEEDINGS APPENDIX

The final page of this brief bears the practitioner's signature.

I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest in this appeal is Brian Morrison, an Arkansas resident residing at 2407 Peach Tree Drive, Little Rock, Arkansas 72211, by virtue of an assignment recorded February 16, 2006, at Reel 017586, Frame 0532.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))

There are no appeals or interferences that will directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))

The status of the claims in this application are:

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

There are 6 claims presented in the application.

B. STATUS OF ALL THE CLAIMS

All 6 claims have been rejected.

C. CLAIMS ON APPEAL

Claims 25 – 30 are the subject of this appeal.

#### IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))

An amendment was filed subsequent to the rejection of June 27, 2005. This amendment was made in response to a non-final action to first, remove a §112 rejection for Claims 26 and 27 by removing the second step (g) and relettering as step (j) and second, to rewrite dependent Claim 30 into independent Claim 25. This amendment was denied entry by the examiner for allegedly raising new issues and for failing to reduce issues for appeal. No other amendments have been filed subsequent to that denial.

V. SUMMARY OF INVENTION (37 C.F.R. § 41.37(c)(1)(v))

The present invention addresses the perceived need in the art for an improved process of treating brake rotors to produce improved molecular structures and enhanced structural properties. The cryogenic process modifies the molecular structure of a brake rotor to increase the useable life span and tolerance of the brake rotor.

The present invention is a process which comprises first determining a mass and cross sectional area of the brake rotors, followed by placing the brake rotors, which are at 100° F, within a cryogenic processing chamber and then cooling the brake rotors at a descent rate to temperatures of approximately -300° F. (Claims 25, 27; Paragraph 20). The decreased temperature is maintained for a stay time before then heating the brake rotors at an ascent rate to 300° F. (Claim 25; Paragraph 21 – 22). The increased temperature is maintained for a post temper time before lowering the temperature to room temperature at a cool down rate. (Claim 25; Paragraph 23). The process continues by raising the temperature a second time at an ascent rate to 300° F and maintaining the temperature for a post temper time before lowering the temperature to room temperature at a cool down rate. (Claim 25; Paragraph 23). The descent rate, the stay time, and the ascent time of the present process are all functions of the mass and cross sectional area of the brake rotors. (Claim 25; Paragraph 25). More than one, and preferably three, post temper cycles or steps are employed. (Claim 26; Paragraph 23).

The claimed invention also involves having the brake rotors be at -100° F before the multiple post temper steps, with the post temper steps occurring within a temper oven. (Claims 28, 29; Paragraph 22).

Moreover, the claimed invention involves introducing gaseous nitrogen into the cryogenic processing chamber to cool the brake components. (Claim 30; Paragraph 20).



VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(1)(vi))

Whether the invention of claims 25 – 30 is unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,865,913 to Paulin et al. in view of U.S. Patent No. 5,447,035 to Workman et al..

## VII. ARGUMENT

### A. REJECTIONS UNDER 35 U.S.C. § 112 (37 C.F.R. § 41.37(c)(1)(vii))

Claim 26 and Claim 27 have been rejected under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as its invention. This rejection is based upon the reference within Claim 26 and Claim 27 to step (j) of Claim 25. Currently, Claim 25 does not mention a step (j); instead, Claim 25 has accidentally lettered step (j) as a second step (g). Applicant has previously attempted to rectify this typographic error through amendment, however this amendment was denied entry by the Examiner. See Exhibit A, Amendment of November 21, 2005. Applicant respectfully requests that Applicant be allowed to submit a second amendment to clarify this issue.

### B. REJECTIONS UNDER 35 U.S.C. § 103 (37 C.F.R. § 41.37(c)(1)(vii))

**There is no evidence that the present invention currently names joint inventors.**

The Examiner has stated in the office action of June 27, 2005 and previously that the current application names joint inventors which requires clarification under 37 C.F.R. §1.56. Applicant has previously respond to this inquiry in its response dated June 19, 2002 that the present invention names only one inventor, Robert Woolley Brunson. Applicant hereby attaches the executed oath and declaration for the present application as Exhibit B to proof of the sole inventorship. Applicant requests that this rejection be withdrawn.

**There is no teaching, suggestion, or motivation for the combination of references of Workman et al. and Paulin et al. to produce the claimed invention.**

Claim 25 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,865,913 to Paulin et al. and U.S. Patent No. 5,447,035 to Workman et al. in view of Workman's disclosure of the cryogenic treatment of semi-metallic brake pads and Paulin's

disclosure of the cryogenic treatment of metal firearm barrels. It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, and the decisions of the Federal Circuit, it is improper to use the present application as a means for suggestion for combining the prior art references. No cited references showing a motivation for a ‘skill in the art’ combination or any reference with a ‘means of suggestion’ has been cited for combining any of these patents, particularly with respect to the cryogenic treatment of metal brake rotors of Appellant’s invention. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

Indeed, to assemble a hypothetical combination such as Appellant’s process of treating brake rotors, all of the examiner’s references would necessitate the removal of an integral and critical component necessary for their proper operation, the MATERIAL BEING MODIFIED. Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or other findings to support a proper obviousness analysis. See *In Re Dembiczak*, 50 U.S.P.Q. 1614, 1618 (Fed. Cir. 1999). Because it is improper to use the present application as a means for suggestion for combining the prior art, Appellant respectfully appeals the obviousness rejection of claim 25. Additionally, in light of the above analysis, Paulin et al. teaches the use of a process for treating firearm barrels, and is thus an inappropriate reference for an obviousness

objection since it teaches away from the invention disclosed in the current application and the use of a process for treating brake rotors. Workman et al. also teaches away from the present invention by disclosing the use of a cryogenic treatment process of a semi-metallic (Col. 2, Lines 41 – 45) brake pad rather than the treatment of a metal brake rotor of the present invention. Workman et al. is thus also an inappropriate reference for an obviousness rejection. Additionally, the combination of the brake pad material of Workman et al. with the process of Paulin et al. would destroy the intention of the invention of Paulin et al. for a cryogenic treatment process of firearm barrels as the semi-metallic material presented by Workman et al. as treated by Paulin et al. would not function as a firearm barrel. Further, the combination of the material of Paulin et al. treated by the process of Workman et al. would produce a brake pad which would be undesirable and defeat the intent of Workman et al. by providing a brake pad with a higher coefficient of martensite steel. A combination of references is improper when the combination destroys the intended purpose of the reference. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). As noted by Workman et al. (Col. 2, Line 62 – 63) and Applicant's disclosure (Paragraph 12), cryogenic treatment processes transform steel particles from the austenitic form to the martensitic form. The martensitic form, as noted by Workman et al. (Col. 2, Line 57), is the harder form of steel. Therefore, the process of Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic steel thus making the end product harder. As noted by Workman et al. (Col. 3, Line 5 – 7), an increase in hardness of the brake pad is undesirable and would degrade the performance of the product. Therefore, the combination of the process of Paulin et al. to the material of Workman et al. destroys the intended purpose of Workman et al. The multiple post temper cycles of Applicant's invention then would not have been obvious to one skilled in the art as the material of Workman et al. would be destroyed if the cycle continued longer than disclosed by Workman et al.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation for determining “a mass and cross sectional area of the brake rotor” to determine the appropriate descent rate, stay time, and ascent rate of the process would have been inherently predetermined at a static phase in the disclosure of Paulin et al. However, Paulin et al. is inappropriate for showing the determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 – 58). Paulin et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does it teach the computation of the stay time and ascent rate based upon these factors. Further, Workman et al. does not reach the computation of descent rate, stay time, and ascent rate based upon the cross-sectional area or mass of the material being treated. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). This limitation of Applicant’s invention is a patentable distinction as it affects the end result of the process.

Surface area and mass are critical factors in determining adequate and thorough heating and cooling of materials. In the present invention, the rotors of Applicant are more appropriately cooled and heated by calculating the appropriate descent rate for the materials. If Applicant were to cool the brake rotors too quickly or too slowly, the process would either create a rotor which had a brittle structure or it would be less effective. If Applicant were to heat the brake rotors too quickly or too slowly, the process would create a less efficient structure. Further, Applicant’s limitation requiring the brake rotors to be maintained at the -300° F and 300° F temperature points for time periods based upon the cross-sectional area and mass of the rotors is not taught by

the prior art. As shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant's disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant's invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant's invention has increased lattice changes to its molecular structure. Further, the increased stay time based upon the mass and cross-sectional area allows for the change in temperature to penetrate the material of the brake rotors completely. This is critically important to the material of Applicant's invention as the interior of the rotors must be thoroughly heated to prevent stresses within the structure. This distinction is not taught by the prior art as it is not critical to the material treated by Paulin et al. or Workman et al. The interior of the brake rotors treated by Applicant must be structurally sound and free of fractures or weakness to adequately transfer heat during the use of the rotor. If the rotors are not heated or cooled thoroughly, the interior portions will contain stressed areas capable of fracture. Therefore, as Paulin et al. and Workman et al. does not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The evaluation of the cross sectional area and mass for Applicant's invention is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 25. Claim 26 – 30 depend directly or indirectly from Claim 25 and contain the patentable limitation of Claim 25. Therefore, Applicant respectfully requests the rejection of Claims 26 – 30 be reversed. Additionally, claims 26 – 30 provide separate and distinct limitations separately patentable from claim 25.

Claim 26 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,865,913 to Paulin et al. and U.S. Patent No. 5,447,035 to Workman et al. in view of Workman's disclosure of the cryogenic treatment of semi-metallic brake pads and Paulin's disclosure of the cryogenic treatment of metal firearm barrels. It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, and the decisions of the Federal Circuit, it is improper to use the present application as a means for suggestion for combining the prior art references. No cited references showing a motivation for a 'skill in the art' combination or any reference with a 'means of suggestion' has been cited for combining any of these patents, particularly with respect to the cryogenic treatment of metal brake rotors of Appellant's invention. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

Indeed, to assemble a hypothetical combination such as Appellant's process of treating brake rotors, all of the examiner's references would necessitate the removal of an integral and critical component necessary for their proper operation, the MATERIAL BEING MODIFIED. Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or other findings to support a proper obviousness analysis. See *In Re Dembiczak*, 50 U.S.P.Q. 1614, 1618 (Fed. Cir. 1999). Because it is improper to use the present application as a

means for suggestion for combining the prior art, Appellant respectfully appeals the obviousness rejection of claim 26. Additionally, in light of the above analysis, Paulin et al. teaches the use of a process for treating firearm barrels, and is thus an inappropriate reference for an obviousness objection since it teaches away from the invention disclosed in the current application and the use of a process for treating brake rotors. Workman et al. also teaches away from the present invention by disclosing the use of a cryogenic treatment process of a semi-metallic (Col. 2, Lines 41 – 45) brake pad rather than the treatment of a metal brake rotor of the present invention. Workman et al. is thus also an inappropriate reference for an obviousness rejection. Additionally, the combination of the brake pad material of Workman et al. with the process of Paulin et al. would destroy the intention of the invention of Paulin et al. for a cryogenic treatment process of firearm barrels as the semi-metallic material presented by Workman et al. as treated by Paulin et al. would not function as a firearm barrel. Further, the combination of the material of Paulin et al. treated by the process of Workman et al. would produce a brake pad which would be undesirable and defeat the intent of Workman et al. by providing a brake pad with a higher coefficient of martensite steel. A combination of references is improper when the combination destroys the intended purpose of the reference. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). As noted by Workman et al. (Col. 2, Line 62 – 63) and Applicant's disclosure (Paragraph 12), cryogenic treatment processes transform steel particles from the austenitic form to the martensitic form. The martensitic form, as noted by Workman et al. (Col. 2, Line 57), is the harder form of steel. Therefore, the process of Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic steel thus making the end product harder. As noted by Workman et al. (Col. 3, Line 5 – 7), an increase in hardness of the brake pad is undesirable and would degrade the performance of the product. Therefore, the combination of the process of Paulin et al. to the material of Workman et al.



destroys the intended purpose of Workman et al. The multiple post temper cycles of Applicant's invention then would not have been obvious to one skilled in the art as the material of Workman et al. would be destroyed if the cycle continued longer than disclosed by Workman et al.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation for determining "a mass and cross sectional area of the brake rotor" to determine the appropriate descent rate, stay time, and ascent rate of the process would have been inherently predetermined at a static phase in the disclosure of Paulin et al. However, Paulin et al. is inappropriate for showing the determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 – 58). Paulin et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does it teach the computation of the stay time and ascent rate based upon these factors. Further, Workman et al. does not reach the computation of descent rate, stay time, and ascent rate based upon the cross-sectional area or mass of the material being treated. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). This limitation of Applicant's invention is a patentable distinction as it affects the end result of the process.

Surface area and mass are critical factors in determining adequate and thorough heating and cooling of materials. In the present invention, the rotors of Applicant are more appropriately cooled and heated by calculating the appropriate descent rate for the materials. If Applicant were to cool the brake rotors too quickly or too slowly, the process would either create a rotor which had a brittle structure or it would be less effective. If Applicant were to heat the brake rotors to

quickly or too slowly, the process would create a less efficient structure. Further, Applicant's limitation requiring the brake rotors to be maintained at the -300° F and 300° F temperature points for time periods based upon the cross-sectional area and mass of the rotors is not taught by the prior art. As shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant's disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant's invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant's invention has increased lattice changes to its molecular structure. Further, the increased stay time based upon the mass and cross-sectional area allows for the change in temperature to penetrate the material of the brake rotors completely. This is critically important to the material of Applicant's invention as the interior of the rotors must be thoroughly heated to prevent stresses within the structure. This distinction is not taught by the prior art as it is not critical to the material treated by Paulin et al. or Workman et al. The interior of the brake rotors treated by Applicant must be structurally sound and free of fractures or weakness to adequately transfer heat during the use of the rotor. If the rotors are not heated or cooled thoroughly, the interior portions will contain stressed areas capable of fracture. Therefore, as Paulin et al. and Workman et al. does not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The evaluation of the cross sectional area and mass for Applicant's invention is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 26. Claim 26 depends directly or indirectly from Claim 25 and contain the patentable limitation of Claim 25. Therefore, Applicant respectfully requests the rejection of Claim 26 be reversed.

Claim 27 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,865,913 to Paulin et al. and U.S. Patent No. 5,447,035 to Workman et al. in view of Workman's disclosure of the cryogenic treatment of semi-metallic brake pads and Paulin's disclosure of the cryogenic treatment of metal firearm barrels. It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, and the decisions of the Federal Circuit, it is improper to use the present application as a means for suggestion for combining the prior art references. No cited references showing a motivation for a 'skill in the art' combination or any reference with a 'means of suggestion' has been cited for combining any of these patents, particularly with respect to the cryogenic treatment of metal brake rotors of Appellant's invention. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

Indeed, to assemble a hypothetical combination such as Appellant's process of treating brake rotors, all of the examiner's references would necessitate the removal of an integral and critical component necessary for their proper operation, the MATERIAL BEING MODIFIED. Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or other findings to support a proper obviousness analysis. See *In Re Dembiczak*, 50 U.S.P.Q. 1614, 1618 (Fed. Cir. 1999). Because it is improper to use the present application as a

means for suggestion for combining the prior art, Appellant respectfully appeals the obviousness rejection of claim 27. Additionally, in light of the above analysis, Paulin et al. teaches the use of a process for treating firearm barrels, and is thus an inappropriate reference for an obviousness objection since it teaches away from the invention disclosed in the current application and the use of a process for treating brake rotors. Workman et al. also teaches away from the present invention by disclosing the use of a cryogenic treatment process of a semi-metallic (Col. 2, Lines 41 – 45) brake pad rather than the treatment of a metal brake rotor of the present invention. Workman et al. is thus also an inappropriate reference for an obviousness rejection. Additionally, the combination of the brake pad material of Workman et al. with the process of Paulin et al. would destroy the intention of the invention of Paulin et al. for a cryogenic treatment process of firearm barrels as the semi-metallic material presented by Workman et al. as treated by Paulin et al. would not function as a firearm barrel. Further, the combination of the material of Paulin et al. treated by the process of Workman et al. would produce a brake pad which would be undesirable and defeat the intent of Workman et al. by providing a brake pad with a higher coefficient of martensite steel. A combination of references is improper when the combination destroys the intended purpose of the reference. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). As noted by Workman et al. (Col. 2, Line 62 – 63) and Applicant's disclosure (Paragraph 12), cryogenic treatment processes transform steel particles from the austenitic form to the martensitic form. The martensitic form, as noted by Workman et al. (Col. 2, Line 57), is the harder form of steel. Therefore, the process of Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic steel thus making the end product harder. As noted by Workman et al. (Col. 3, Line 5 – 7), an increase in hardness of the brake pad is undesirable and would degrade the performance of the product. Therefore, the combination of the process of Paulin et al. to the material of Workman et al.

destroys the intended purpose of Workman et al. The multiple post temper cycles of Applicant's invention then would not have been obvious to one skilled in the art as the material of Workman et al. would be destroyed if the cycle continued longer than disclosed by Workman et al.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation of Claim 27 requiring the temperature of the brake rotors to be approximately 100 degrees F reads upon ambient temperature. The disclosure of Workman et al. and Paulin et al. disclose the placement of the materials within the cryogenic processing chamber **while the materials are at ambient (72° F)**. (Workman et al., Col 3, Line 52) (Paulin et al., Col. 3, Line 47). Neither reference discloses the use of a temperature above ambient temperature at this stage in the process. Indeed, both references specifically teach away from Applicant's disclosure of pre-heated brake rotors at this stage of the process. This limitation of providing heated materials prior to cooling the materials is a patentable distinction different from the prior art of Paulin et al. and Workman et al. The molecular lattice structure of the brake rotors of Applicant's invention will be substantially different from the brake rotors at room temperature prior to cooling. This difference will affect the end result and the structure of the brake rotor. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). Therefore, as Paulin et al. and Workman et al. do not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. or Workman et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The heating of materials prior to the cooling process of Applicant's

invention are not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 27.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation for determining “a mass and cross sectional area of the brake rotor” to determine the appropriate descent rate, stay time, and ascent rate of the process would have been inherently predetermined at a static phase in the disclosure of Paulin et al. However, Paulin et al. is inappropriate for showing the determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 – 58). Paulin et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does it teach the computation of the stay time and ascent rate based upon these factors. Further, Workman et al. does not reach the computation of descent rate, stay time, and ascent rate based upon the cross-sectional area or mass of the material being treated. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). This limitation of Applicant’s invention is a patentable distinction as it affects the end result of the process.

Surface area and mass are critical factors in determining adequate and thorough heating and cooling of materials. In the present invention, the rotors of Applicant are more appropriately cooled and heated by calculating the appropriate descent rate for the materials. If Applicant were to cool the brake rotors too quickly or too slowly, the process would either create a rotor which had a brittle structure or it would be less effective. If Applicant were to heat the brake rotors too quickly or too slowly, the process would create a less efficient structure. Further, Applicant’s

limitation requiring the brake rotors to be maintained at the -300° F and 300° F temperature points for time periods based upon the cross-sectional area and mass of the rotors is not taught by the prior art. As shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant's disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant's invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant's invention has increased lattice changes to its molecular structure. Further, the increased stay time based upon the mass and cross-sectional area allows for the change in temperature to penetrate the material of the brake rotors completely. This is critically important to the material of Applicant's invention as the interior of the rotors must be thoroughly heated to prevent stresses within the structure. This distinction is not taught by the prior art as it is not critical to the material treated by Paulin et al. or Workman et al. The interior of the brake rotors treated by Applicant must be structurally sound and free of fractures or weakness to adequately transfer heat during the use of the rotor. If the rotors are not heated or cooled thoroughly, the interior portions will contain stressed areas capable of fracture. Therefore, as Paulin et al. and Workman et al. does not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The evaluation of the cross sectional area and mass for Applicant's invention is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 27. Claim 27 depends directly or indirectly from Claim 25 and contain the patentable limitation of Claim 25. Therefore, Applicant respectfully requests the rejection of Claim 27 be reversed.

Claim 28 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,865,913 to Paulin et al. and U.S. Patent No. 5,447,035 to Workman et al. in view of Workman's disclosure of the cryogenic treatment of semi-metallic brake pads and Paulin's disclosure of the cryogenic treatment of metal firearm barrels. It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, and the decisions of the Federal Circuit, it is improper to use the present application as a means for suggestion for combining the prior art references. No cited references showing a motivation for a 'skill in the art' combination or any reference with a 'means of suggestion' has been cited for combining any of these patents, particularly with respect to the cryogenic treatment of metal brake rotors of Appellant's invention. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

Indeed, to assemble a hypothetical combination such as Appellant's process of treating brake rotors, all of the examiner's references would necessitate the removal of an integral and critical component necessary for their proper operation, the MATERIAL BEING MODIFIED. Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or other findings to support a proper obviousness analysis. See *In Re Dembiczak*, 50 U.S.P.Q. 1614, 1618 (Fed. Cir. 1999). Because it is improper to use the present application as a



means for suggestion for combining the prior art, Appellant respectfully appeals the obviousness rejection of claim 28. Additionally, in light of the above analysis, Paulin et al. teaches the use of a process for treating firearm barrels, and is thus an inappropriate reference for an obviousness objection since it teaches away from the invention disclosed in the current application and the use of a process for treating brake rotors. Workman et al. also teaches away from the present invention by disclosing the use of a cryogenic treatment process of a semi-metallic (Col. 2, Lines 41 – 45) brake pad rather than the treatment of a metal brake rotor of the present invention. Workman et al. is thus also an inappropriate reference for an obviousness rejection. Additionally, the combination of the brake pad material of Workman et al. with the process of Paulin et al. would destroy the intention of the invention of Paulin et al. for a cryogenic treatment process of firearm barrels as the semi-metallic material presented by Workman et al. as treated by Paulin et al. would not function as a firearm barrel. Further, the combination of the material of Paulin et al. treated by the process of Workman et al. would produce a brake pad which would be undesirable and defeat the intent of Workman et al. by providing a brake pad with a higher coefficient of martensite steel. A combination of references is improper when the combination destroys the intended purpose of the reference. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). As noted by Workman et al. (Col. 2, Line 62 – 63) and Applicant's disclosure (Paragraph 12), cryogenic treatment processes transform steel particles from the austenitic form to the martensitic form. The martensitic form, as noted by Workman et al. (Col. 2, Line 57), is the harder form of steel. Therefore, the process of Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic steel thus making the end product harder. As noted by Workman et al. (Col. 3, Line 5 – 7), an increase in hardness of the brake pad is undesirable and would degrade the performance of the product. Therefore, the combination of the process of Paulin et al. to the material of Workman et al.

destroys the intended purpose of Workman et al. The multiple post temper cycles of Applicant's invention then would not have been obvious to one skilled in the art as the material of Workman et al. would be destroyed if the cycle continued longer than disclosed by Workman et al.

The Examiner has asserted that the limitation of Claim 28 requiring the temperature of the brake rotors to be approximately -100 degrees F is inherently shown in the teaching of Workman et al.. The disclosure of Workman et al. teaches the gradual heating of the materials over the span of a day after the cooling step of step (d) prior the heating of step (e). The materials of Workman et al. are disclosed to be at ambient temperature prior to the heating step of step (e). (Col. 4, Lines 3 – 4). Neither the reference of Workman et al. nor the reference of Paulin et al. discloses the use of a temperature below ambient temperature at this stage in the process. Indeed, both references specifically teach away from Applicant's disclosure of cooled brake rotors at this stage of the process. This limitation of providing cooled materials prior to heating the materials is a patentable distinction different from the prior art of Paulin et al. and Workman et al. The molecular lattice structure of the brake rotors of Applicant's invention will be substantially different from the brake rotors at room temperature prior to heating. This difference will affect the end result and the structure of the brake rotor. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). Therefore, as Paulin et al. and Workman et al. do not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. or Workman et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The process of heating cooled materials of Applicant's invention is not

suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 28.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation for determining “a mass and cross sectional area of the brake rotor” to determine the appropriate descent rate, stay time, and ascent rate of the process would have been inherently predetermined at a static phase in the disclosure of Paulin et al. However, Paulin et al. is inappropriate for showing the determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 – 58). Paulin et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does it teach the computation of the stay time and ascent rate based upon these factors. Further, Workman et al. does not reach the computation of descent rate, stay time, and ascent rate based upon the cross-sectional area or mass of the material being treated. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). This limitation of Applicant’s invention is a patentable distinction as it affects the end result of the process.

Surface area and mass are critical factors in determining adequate and thorough heating and cooling of materials. In the present invention, the rotors of Applicant are more appropriately cooled and heated by calculating the appropriate descent rate for the materials. If Applicant were to cool the brake rotors too quickly or too slowly, the process would either create a rotor which had a brittle structure or it would be less effective. If Applicant were to heat the brake rotors too quickly or too slowly, the process would create a less efficient structure. Further, Applicant’s

limitation requiring the brake rotors to be maintained at the -300° F and 300° F temperature points for time periods based upon the cross-sectional area and mass of the rotors is not taught by the prior art. As shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant's disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant's invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant's invention has increased lattice changes to its molecular structure. Further, the increased stay time based upon the mass and cross-sectional area allows for the change in temperature to penetrate the material of the brake rotors completely. This is critically important to the material of Applicant's invention as the interior of the rotors must be thoroughly heated to prevent stresses within the structure. This distinction is not taught by the prior art as it is not critical to the material treated by Paulin et al. or Workman et al. The interior of the brake rotors treated by Applicant must be structurally sound and free of fractures or weakness to adequately transfer heat during the use of the rotor. If the rotors are not heated or cooled thoroughly, the interior portions will contain stressed areas capable of fracture. Therefore, as Paulin et al. and Workman et al. does not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The evaluation of the cross sectional area and mass for Applicant's invention is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 28. Claim 28 depends directly or indirectly from Claim 25 and contain the patentable limitation of Claim 25. Therefore, Applicant respectfully requests the rejection of Claim 28 be reversed.

Claim 29 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,865,913 to Paulin et al. and U.S. Patent No. 5,447,035 to Workman et al. in view of Workman's disclosure of the cryogenic treatment of semi-metallic brake pads and Paulin's disclosure of the cryogenic treatment of metal firearm barrels. It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, and the decisions of the Federal Circuit, it is improper to use the present application as a means for suggestion for combining the prior art references. No cited references showing a motivation for a 'skill in the art' combination or any reference with a 'means of suggestion' has been cited for combining any of these patents, particularly with respect to the cryogenic treatment of metal brake rotors of Appellant's invention. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

Indeed, to assemble a hypothetical combination such as Appellant's process of treating brake rotors, all of the examiner's references would necessitate the removal of an integral and critical component necessary for their proper operation, the MATERIAL BEING MODIFIED. Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or other findings to support a proper obviousness analysis. See *In Re Dembiczak*, 50 U.S.P.Q. 1614, 1618 (Fed. Cir. 1999). Because it is improper to use the present application as a

means for suggestion for combining the prior art, Appellant respectfully appeals the obviousness rejection of claim 29. Additionally, in light of the above analysis, Paulin et al. teaches the use of a process for treating firearm barrels, and is thus an inappropriate reference for an obviousness objection since it teaches away from the invention disclosed in the current application and the use of a process for treating brake rotors. Workman et al. also teaches away from the present invention by disclosing the use of a cryogenic treatment process of a semi-metallic (Col. 2, Lines 41 – 45) brake pad rather than the treatment of a metal brake rotor of the present invention. Workman et al. is thus also an inappropriate reference for an obviousness rejection. Additionally, the combination of the brake pad material of Workman et al. with the process of Paulin et al. would destroy the intention of the invention of Paulin et al. for a cryogenic treatment process of firearm barrels as the semi-metallic material presented by Workman et al. as treated by Paulin et al. would not function as a firearm barrel. Further, the combination of the material of Paulin et al. treated by the process of Workman et al. would produce a brake pad which would be undesirable and defeat the intent of Workman et al. by providing a brake pad with a higher coefficient of martensite steel. A combination of references is improper when the combination destroys the intended purpose of the reference. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). As noted by Workman et al. (Col. 2, Line 62 – 63) and Applicant's disclosure (Paragraph 12), cryogenic treatment processes transform steel particles from the austenitic form to the martensitic form. The martensitic form, as noted by Workman et al. (Col. 2, Line 57), is the harder form of steel. Therefore, the process of Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic steel thus making the end product harder. As noted by Workman et al. (Col. 3, Line 5 – 7), an increase in hardness of the brake pad is undesirable and would degrade the performance of the product. Therefore, the combination of the process of Paulin et al. to the material of Workman et al.

destroys the intended purpose of Workman et al. The multiple post temper cycles of Applicant's invention then would not have been obvious to one skilled in the art as the material of Workman et al. would be destroyed if the cycle continued longer than disclosed by Workman et al.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation of Claim 29 requiring the step of moving the brake rotors to a tempering oven during step (f) would have been inherently done in the heating step of Paulin et al. The disclosure of Workman et al. and Paulin et al. disclose the placement of the materials within the cryogenic processing chamber. (Workman et al., Col 3, Line 52) (Paulin et al., Col. 3, Line 47). Neither reference discloses the use of a tempering oven for step (f). "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). Therefore, as Paulin et al. and Workman et al. do not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. or Workman et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The heating of materials within a tempering oven of Applicant's invention are not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 29.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation for determining "a mass and cross sectional area of the brake rotor" to determine the appropriate descent rate, stay time, and ascent rate of the process would have been inherently predetermined at a static phase in the disclosure of Paulin et al. However, Paulin et al. is inappropriate for showing the determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the

calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 – 58). Paulin et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does it teach the computation of the stay time and ascent rate based upon these factors. Further, Workman et al. does not reach the computation of descent rate, stay time, and ascent rate based upon the cross-sectional area or mass of the material being treated. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). This limitation of Applicant’s invention is a patentable distinction as it affects the end result of the process.

Surface area and mass are critical factors in determining adequate and thorough heating and cooling of materials. In the present invention, the rotors of Applicant are more appropriately cooled and heated by calculating the appropriate descent rate for the materials. If Applicant were to cool the brake rotors too quickly or too slowly, the process would either create a rotor which had a brittle structure or it would be less effective. If Applicant were to heat the brake rotors too quickly or too slowly, the process would create a less efficient structure. Further, Applicant’s limitation requiring the brake rotors to be maintained at the -300° F and 300° F temperature points for time periods based upon the cross-sectional area and mass of the rotors is not taught by the prior art. As shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant’s disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant’s invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant’s invention has increased lattice changes to



its molecular structure. Further, the increased stay time based upon the mass and cross-sectional area allows for the change in temperature to penetrate the material of the brake rotors completely. This is critically important to the material of Applicant's invention as the interior of the rotors must be thoroughly heated to prevent stresses within the structure. This distinction is not taught by the prior art as it is not critical to the material treated by Paulin et al. or Workman et al. The interior of the brake rotors treated by Applicant must be structurally sound and free of fractures or weakness to adequately transfer heat during the use of the rotor. If the rotors are not heated or cooled thoroughly, the interior portions will contain stressed areas capable of fracture. Therefore, as Paulin et al. and Workman et al. does not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The evaluation of the cross sectional area and mass for Applicant's invention is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 29. Claim 29 depends directly or indirectly from Claim 25 and contain the patentable limitation of Claim 25. Therefore, Applicant respectfully requests the rejection of Claim 29 be reversed.

Claim 30 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,865,913 to Paulin et al. and U.S. Patent No. 5,447,035 to Workman et al. in view of Workman's disclosure of the cryogenic treatment of semi-metallic brake pads and Paulin's disclosure of the cryogenic treatment of metal firearm barrels. It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, and the decisions of the Federal Circuit, it is improper to use the present application as a means for suggestion for combining the prior art references. No cited references showing a motivation for

a ‘skill in the art’ combination or any reference with a ‘means of suggestion’ has been cited for combining any of these patents, particularly with respect to the cryogenic treatment of metal brake rotors of Appellant’s invention. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

Indeed, to assemble a hypothetical combination such as Appellant’s process of treating brake rotors, all of the examiner’s references would necessitate the removal of an integral and critical component necessary for their proper operation, the MATERIAL BEING MODIFIED. Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or other findings to support a proper obviousness analysis. See *In Re Dembiczak*, 50 U.S.P.Q. 1614, 1618 (Fed. Cir. 1999). Because it is improper to use the present application as a means for suggestion for combining the prior art, Appellant respectfully appeals the obviousness rejection of claim 30. Additionally, in light of the above analysis, Paulin et al. teaches the use of a process for treating firearm barrels, and is thus an inappropriate reference for an obviousness objection since it teaches away from the invention disclosed in the current application and the use of a process for treating brake rotors. Workman et al. also teaches away from the present invention by disclosing the use of a cryogenic treatment process of a semi-metallic (Col. 2, Lines 41 – 45) brake pad rather than the treatment of a metal brake rotor of the present invention. Workman et al. is thus also an inappropriate reference for an obviousness rejection. Additionally, the combination of the

brake pad material of Workman et al. with the process of Paulin et al. would destroy the intention of the invention of Paulin et al. for a cryogenic treatment process of firearm barrels as the semi-metallic material presented by Workman et al. as treated by Paulin et al. would not function as a firearm barrel. Further, the combination of the material of Paulin et al. treated by the process of Workman et al. would produce a brake pad which would be undesirable and defeat the intent of Workman et al. by providing a brake pad with a higher coefficient of martensite steel. A combination of references is improper when the combination destroys the intended purpose of the reference. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). As noted by Workman et al. (Col. 2, Line 62 – 63) and Applicant's disclosure (Paragraph 12), cryogenic treatment processes transform steel particles from the austenitic form to the martensitic form. The martensitic form, as noted by Workman et al. (Col. 2, Line 57), is the harder form of steel. Therefore, the process of Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic steel thus making the end product harder. As noted by Workman et al. (Col. 3, Line 5 – 7), an increase in hardness of the brake pad is undesirable and would degrade the performance of the product. Therefore, the combination of the process of Paulin et al. to the material of Workman et al. destroys the intended purpose of Workman et al. The multiple post temper cycles of Applicant's invention then would not have been obvious to one skilled in the art as the material of Workman et al. would be destroyed if the cycle continued longer than disclosed by Workman et al.

The Examiner asserts that the limitation of Claim 30 requiring the use of gaseous nitrogen would have been obvious to one skilled in the art to modify the disclosures of Workman et al. and Paulin et al. The disclosure of Workman et al. and Paulin et al. disclose the use of liquid nitrogen (Workman et al., Col 3, Line 32) (Paulin et al., Col. 3, Line 26) and only liquid nitrogen. Neither reference discloses the use of gaseous nitrogen to reduce the temperature of the materials. In fact,

Paulin et al. teaches that the use of liquid nitrogen has its limits, which sometimes causes thermal shock. (Col. 1, Line 47 – 48). Despite this unwanted side effect, Paulin et al. utilizes liquid nitrogen as the means for cooling the gun barrels. If the substitution of gaseous nitrogen were obvious to one skilled in the art, Paulin et al. would have made this substitution to prevent thermal shock. However, since Paulin et al. did not make this substitution, it therefore, must not be obvious to one skilled in the art to substitute gaseous nitrogen to aid with slower cooling. This limitation of providing gaseous nitrogen is patentably distinct from the prior art of Paulin et al. and Workman et al. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). Therefore, as Paulin et al. and Workman et al. do not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. or Workman et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The cooling of materials through the use of gaseous nitrogen is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 30.

In the Office Action of June 27, 2005, the Examiner asserts that the limitation for determining “a mass and cross sectional area of the brake rotor” to determine the appropriate descent rate, stay time, and ascent rate of the process would have been inherently predetermined at a static phase in the disclosure of Paulin et al. However, Paulin et al. is inappropriate for showing the determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 – 58). Paulin et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does

it teach the computation of the stay time and ascent rate based upon these factors. Further, Workman et al. does not reach the computation of descent rate, stay time, and ascent rate based upon the cross-sectional area or mass of the material being treated. “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” MPEP § 2143.01 (*citing In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)). This limitation of Applicant’s invention is a patentable distinction as it affects the end result of the process.

Surface area and mass are critical factors in determining adequate and thorough heating and cooling of materials. In the present invention, the rotors of Applicant are more appropriately cooled and heated by calculating the appropriate descent rate for the materials. If Applicant were to cool the brake rotors too quickly or too slowly, the process would either create a rotor which had a brittle structure or it would be less effective. If Applicant were to heat the brake rotors too quickly or too slowly, the process would create a less efficient structure. Further, Applicant’s limitation requiring the brake rotors to be maintained at the -300° F and 300° F temperature points for time periods based upon the cross-sectional area and mass of the rotors is not taught by the prior art. As shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant’s disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant’s invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant’s invention has increased lattice changes to its molecular structure. Further, the increased stay time based upon the mass and cross-sectional area allows for the change in temperature to penetrate the material of the brake rotors

completely. This is critically important to the material of Applicant's invention as the interior of the rotors must be thoroughly heated to prevent stresses within the structure. This distinction is not taught by the prior art as it is not critical to the material treated by Paulin et al. or Workman et al. The interior of the brake rotors treated by Applicant must be structurally sound and free of fractures or weakness to adequately transfer heat during the use of the rotor. If the rotors are not heated or cooled thoroughly, the interior portions will contain stressed areas capable of fracture. Therefore, as Paulin et al. and Workman et al. does not teach this limitation and the Examiner has not provided a teaching, suggestion, or motivation for modifying Paulin et al. to produce this limitation, Applicant requests that the §103 rejection be reversed. The evaluation of the cross sectional area and mass for Applicant's invention is not suggested or taught by the prior art, and therefore, Appellant respectfully appeals the §103(a) rejection of Claim 30. Claim 30 depends directly or indirectly from Claim 25 and contain the patentable limitation of Claim 25. Therefore, Applicant respectfully requests the rejection of Claim 30 be reversed.

C. SUMMARY ARGUING PATENTABILITY OF ALL CLAIMS

Appellant further respectfully argues the patentability of all claims presented on appeal. The prior art fails to show a cryogenic process for treating brake rotors utilizing a cooling cycle and multiple heating cycles while using a function of the cross sectional area and mass of the rotors to determine the descent rate, stay time period, and ascent rate of the cooling and heating cycles. Further, the prior art fails to teach the treatment of previously heated materials present immediately prior to the cooling period and cooled materials immediately prior to the heating periods. Additionally, the prior art fails to show the use of gaseous nitrogen as a tool for cooling the materials.

VIII. CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii))

The text of the claims involved in the appeal are:

Claim 25: A method for deep cryogenic tempering of metallic brake rotors, the method comprising the steps of:

- (a) determining a mass and cross sectional area of the brake rotors;
- (b) placing the brake rotors at a temperature within a cryogenic processing chamber;
- (c) cooling the brake rotors at a descent rate, the descent rate being a function of the mass and cross sectional area of the brake rotors, until the temperature of the brake rotors is approximately -300° F;
- (d) maintaining the brake rotors temperature at -300° F for a stay time, the stay time being a function of the mass and the cross sectional area of the brake rotors;
- (e) raising the temperature of the brake rotors to approximately 300° F at an ascent rate, the ascent rate being a function of the mass and the cross sectional area of the brake rotors;
- (f) maintaining the temperature of the brake rotors at 300° F for a post temper time;
- (g) lowering the temperature of the brake rotors to room temperature at a cool down rate;
- (h) raising the temperature of the brake rotors to approximately 300° F at an ascent rate;
- (i) maintaining the temperature of the brake rotors at 300° F for a post temper time; and



(g) lowering the temperature of the brake rotors to room temperature at a cool down rate.

Claim 26: The method of Claim 25, wherein steps (h), (i), and (g) are repeated for a third post temper time.

Claim 27: The method of Claim 26, wherein:

the temperature of the brake rotors is approximately 100 degrees F at step (b).

Claim 28: The method of Claim 25 further comprising the step of:

Raising the temperature of the brake rotors to approximately -100° F within the cryogenic processing chamber after step (d) and before step (e).

Claim 29: The method of Claim 25 further comprising the step of transporting the brake rotors to a tempering oven during step (f).

Claim 30: The method of Claim 25, wherein the cooling of the brake rotors is accomplished by introducing gaseous nitrogen into the cryogenic processing chamber.

IX. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix))

A. Amendment of November 21, 2005

B. Declaration of sole inventor, Robert Woolley Brunson

X. RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x))

None.

Respectfully submitted,

KEISLING PIEPER & SCOTT PLC



Meredith K. Lowry, Reg. No. 58,422  
1 East Center Street, Suite 217  
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(479) 251-0800  
Attorneys for Appellant

Date: 10.2.06

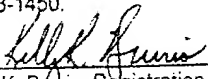


**PATENT**  
4750-000003/US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**CERTIFICATE OF MAILING UNDER 37 CFR 1.8**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service on November 21, 2005, with sufficient postage as first class mail (including Express Mail per MPEP § 512), and addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

  
Kelly K. Burris, Registration No. 46,361

Application No.: 09/844,526  
Filing Date: April 27, 2001  
Applicant: Robert Woolley Brunson  
Group Art Unit: 1742  
Confirmation No: 3732  
Examiner: Ip Sikyin  
Title: DEEP CRYOGENIC TEMPERING OF BRAKE COMPONENTS  
Attorney Docket: 4750-000002

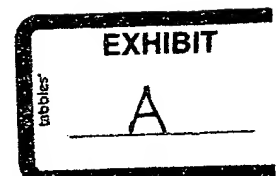
Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**AMENDMENT**

In response to the Office Action mailed June 27, 2005, please amend the application as follows and consider the remarks set forth below.

Applicant hereby petitions under the provisions of 37 C.F.R. § 1.136(a) for an extension of time in which to respond to the outstanding Office Action and includes a fee as set forth in 37 C.F.R. § 1.17(a) with this response for such extension of time.

**EV 726255554 US**



**Amendments to the Claims** begin on page 3 of this paper.

**Remarks** begin on page 8 of this paper.

## AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

### LISTING OF CLAIMS

1-8. Cancelled.

9. (Withdrawn) A cryogenically tempered brake component, the brake component comprising:

a material;

a geometrical cross section;

a mass; and

an improved molecular structure,

wherein the improved molecular structure is dependent on the material, the geometrical cross section, and the mass.

10. (Withdrawn) The cryogenically tempered brake component of Claim 9, wherein the brake component further comprises a brake rotor.

11. (Withdrawn) The cryogenically tempered brake component of Claim 9, wherein the brake component further comprises a brake drum.

12. (Withdrawn) A cryogenically tempered brake component having an improved molecular structure achieved by cooling the brake component to approximately  $-300^{\circ}$  F, wherein the brake component has improved structural properties.

13. (Withdrawn) The cryogenically tempered brake component of Claim 12, wherein the improved structural property is improved warpage resistance.

14. (Withdrawn) The cryogenically tempered brake component of Claim 12, wherein the improved structural property is improved heat resistance.

15. (Withdrawn) The cryogenically tempered brake component of Claim 12, wherein the improved structural property is reduced heat checking.

16. (Withdrawn) The cryogenically tempered brake component of Claim 12, wherein the improved structural property is reduced fading.

17. (Withdrawn) The cryogenically tempered brake component of Claim 12, wherein the improved structural property is reduced cracking.

18. (Withdrawn) A cryogenically tempered brake component made by the process of:

cooling the brake component to approximately  $-300^{\circ}$  F, and maintaining the brake component at approximately  $-300^{\circ}$  F for a stay time;

subsequently heating the brake component to approximately  $300^{\circ}$  F, and maintaining the brake component at approximately  $300^{\circ}$  F for a post temper time; and

cooling the brake component to ambient temperature.

19. (Withdrawn) A cryogenically tempered brake component made by a process of cooling the brake component to approximately  $-300^{\circ}$  F and heating the brake component to approximately  $300^{\circ}$  F according to a processing profile that improves a service life of the brake component.

20. (Withdrawn) The cryogenically tempered brake component of Claim 19, wherein the service life of the brake component is achieved by improved warpage resistance.

21. (Withdrawn) The cryogenically tempered brake component of Claim 19, wherein the service life of the brake component is achieved by improved heat resistance.

22. (Withdrawn) The cryogenically tempered brake component of Claim 19, wherein the service life of the brake component is achieved by reduced heat checking.

23. (Withdrawn) The cryogenically tempered brake component of Claim 19, wherein the service life of the brake component is achieved by reduced fading.

24. (Withdrawn) The cryogenically tempered brake component of Claim 19, wherein the service life of the brake component is achieved by reduced cracking.

25. (Currently Amended) A method for deep cryogenic tempering of metallic brake rotors, the method comprising the steps of:

- (a) determining a mass and cross sectional area of the brake rotors;
- (b) placing the brake rotors at a temperature within a cryogenic processing chamber;
- (c) cooling the brake rotors at a descent rate, the descent rate being a function of the mass and the cross sectional area of the brake rotors, until the temperature of the brake rotors is approximately  $-300^{\circ}\text{F}$ , the cooling accomplished by introducing gaseous nitrogen into the cryogenic processing chamber;
- (d) maintaining the brake rotors temperature at  $-300^{\circ}\text{F}$  for a stay time, the stay time being a function of the mass and the cross sectional area of the brake rotors;



(e) raising the temperature of the brake rotors to approximately 300° F at an ascent rate, the ascent rate being a function of the mass and the cross sectional area of the brake rotors;

(f) maintaining the temperature of the brake rotors at 300° F for a post temper time;

(g) lowering the temperature of the brake rotors to room temperature at a cool down rate;

(h) raising the temperature of the brake rotors to approximately 300° F at an ascent rate;

(i) maintaining the temperature of the brake rotors at 300° F for a post temper time; and

[[ (g) ] (j) lowering the temperature of the brake rotors to room temperature at a cool down rate.

26. (Previously Presented) The method of Claim 25, wherein steps (h), (i), and (j) are repeated for a third post temper time.

27. (Previously Presented) The method of Claim 26, wherein:

the temperature of the brake rotors is approximately 100 degrees F at step

(b).

28. (Previously Presented) The method of Claim 25 further comprising the step of:

raising the temperature of the brake rotors to approximately -100° F within the cryogenic processing chamber after step (d) and before step (e).

29. (Previously Presented) The method of Claim 25 further comprising the step of transporting the brake rotors to a tempering oven during step (f).

30. Cancelled.

### REMARKS

Claims 9-30 are pending in the present application, and Claims 25-30 stand rejected. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

#### REJECTION UNDER 35 U.S.C. § 112

Claims 26-27 are rejected under 35 U.S.C. § 112 as being indefinite because there is no step j in Claim 25.

Applicant has amended Claim 25 to correct a typographical error such that step j is included. Therefore, since there is now a step j in Claim 25, Applicant respectfully requests that these claim rejections be withdrawn.

#### REJECTION UNDER 35 U.S.C. § 103

Claims 25-30 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Pat. No. 5,865,913 to Paulin et al. in view of U.S. Pat. No. 5,447,035 to Workman et al. This rejection is respectfully traversed.

Claim 25 has been amended to include the limitation that the cooling of the brake rotors is accomplished by introducing **gaseous** nitrogen into the cryogenic processing chamber. Neither Paulin et al. nor Workman et al. disclose, teach or suggest the use of gaseous nitrogen to cool the components being treated. As a matter of fact, both Paulin et al. and Workman et al. specifically disclose **liquid nitrogen** and thus there can be no motivation to combine these references to achieve the claimed invention. (See, e.g., Paulin et al. at Col. 3, Lines 26, 27 and Workman et al. at Col. 3, Lines 32, 33). The use of a gaseous form of a cryogenic substance is different than a liquid form, and the brake

rotors of the claimed invention are exposed to gaseous nitrogen rather than liquid nitrogen to prevent thermal shock. Both of the cited references disclose liquid nitrogen, not gaseous nitrogen, and thus amended Claim 25 cannot be obvious. Accordingly, Applicant respectfully requests that the outstanding claim rejections be withdrawn.

Claims 26-29 depend from Claim 25 and distinguish over the prior art for at least the reasons stated above in connection with Claim 25. Therefore, Applicant respectfully requests that these claim rejections also be withdrawn.

Claim 30 has been cancelled without prejudice.

#### CONCLUSION

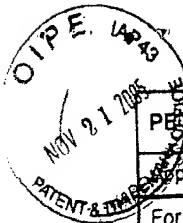
It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (314) 726-7524.

Respectfully submitted,

Dated: 21 NOV 05

By: Kelly K. Burris  
Kelly K. Burris, Reg. No. 46,361

HARNES, DICKEY & PIERCE, P.L.C.  
7700 Bonhomme Avenue, Suite 400  
St. Louis, MO 63105  
(314) 726-7500  
KKB/ljs



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) 4750-000003/US
Application Number 09/844,526		Filed 04/27/2001
For <b>DEEP CRYOGENIC TEMPERING OF BRAKE COMPONENTS</b>		
Art Unit 1742	Examiner Ip Sikyin	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
<input checked="" type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$225
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____

- ☒ Applicant claims small entity status. See 37 CFR 1.27.
- ☒ A check in the amount of the fee is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0750. I have enclosed a duplicate copy of this sheet.

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

- I am the ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71
- Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).
- ☒ attorney or agent of record. Registration Number 46,361
- ☐ attorney or agent under 37 CFR 1.34(a).
- Registration number if acting under 37 CFR 1.34(a) \_\_\_\_\_

Kelly K. Burris  
Signature  
Kelly K. Burris  
Typed or printed name

November 21, 2005  
Date  
(314) 726-7500  
Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

- ☒ Total of 1 forms are submitted.

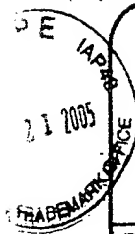
This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

11/23/2005 SDENR001 00000019 09844526 225.00 0P

02 FC:2252

EV 726255554 US



# TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/844,526
Filing Date	04/27/2001
First Named Inventor	Robert Woolley Brunson
Art Unit	1742
Examiner Name	Ip Sikyin
Total Number of Pages in This Submission	14
Attorney Docket Number	4750-000003/US

## ENCLOSURES (check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form <input checked="" type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment (9 pages) <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input checked="" type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Return Receipt Postcard; and Check in the amount of \$475.00.
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Remarks

## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm	Harness, Dickey & Pierce, P.L.C.		
Signature			
Printed Name	Kelly K. Burris		
Date	11/21/2005	Reg. No.	46,361

## CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Typed or printed name	Kelly K. Burris	Express Mail Label No.	EV 726255554 US
Signature		Date	11/21/2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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EV 726255554 US

**FEE TRANSMITTAL  
for FY 2005**

Effective 10/01/2004. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27TOTAL AMOUNT OF PAYMENT (\$)  
475

Complete if Known	
Application Number	09/844,526
Filing Date	04/27/2001
First Named Inventor	Robert Woolley Brunson
Examiner Name	In Sikytin
Art Unit	1742
Attorney Docket No.	4750-000003/US

## METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money ☐ Other ☐ None☒ Deposit Account:Deposit  
Account  
Number

08-0750

Deposit  
Account  
Name

Harness, Dickey &amp; Pierce, P.L.C.

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) or any underpayment of fees under 37 CFR 1.16 and 1.17☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

## 1. BASIC FILING FEE

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1011	300	2011	150	Utility filing fee	
1012	200	2012	100	Design filing fee	
1013	200	2013	100	Plant filing fee	
1014	300	2014	150	Reissue filing fee	
1005	200	2005	100	Provisional filing fee	

SUBTOTAL (1)

(\$)  
0

## 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	-20**	=	0	X	Fee from below	=	0	Fee Paid
Independent Claims	-3**	=	0	X		=	0	
Multiple Dependent		=		X		=	0	

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1202	50	2202	25	Claims in excess of 20	
1201	200	2201	100	Independent claims in excess of 3	
1203	350	2203	180	Multiple dependent claim, if not paid	
1204	200	2204	100	** Reissue independent claims over original patent	
1205	50	2205	25	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2)

(\$)  
0

\*\*or number previously paid, if greater. For Reissues, see above

## FEE CALCULATION (continued)

3. ADDITIONAL FEES  
Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	225
1253	1020	2253	510	Extension for reply within third month	
1254	1,580	2254	795	Extension for reply within fourth month	
1255	2,160	2255	1080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	250
1402	500	2402	250	Filing a brief in support of an appeal	
1403	1000	2403	500	Request for oral hearing	
1452	500	2452	250	Petition to revive - unavoidable	
1453	1500	2453	750	Petition to revive - unintentional	
1501	1400	2501	700	Utility issue fee (or reissue)	
1502	800	2502	400	Design issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17 (q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	

Other fee (specify) \_\_\_\_\_

\*Reduced by Basic Filing Fee Paid SUBTOTAL (3)

(\$)  
475

## 4. SEARCH/EXAMINATION FEES

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1111	500	2111	250	Utility Search Fee	
1112	100	2112	50	Design Search Fee	
1113	300	2113	150	Plant Search Fee	
1114	500	2114	250	Reissue Search Fee	
1311	200	2311	100	Utility Examination Fee	
1312	130	2312	65	Design Examination Fee	
1313	150	2313	80	Plant Examination Fee	
1314	600	2314	300	Reissue Examination Fee	

SUBTOTAL (4)

(\$)  
0

## SUBMITTED BY

Name (Print/Type)

Kelly K. Burris

Registration No.  
(Attorney/Agent)

46,361

Telephone

(314) 726-7500

Signature

*Kelly K. Burris*

Date

11/21/2005

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EV 726255554 US

**DECLARATION AND POWER OF ATTORNEY**

Attorney Docket No. 4750-000002

**DECLARATION**

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**DEEP CRYOGENIC TEMPERING OF BRAKE COMPONENTS**

the specification of which (check one)

- ☒ is attached hereto.  
or  
☐ was filed on \_\_\_\_\_ as Application Serial No. or PCT  
International Application No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if  
applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.55, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. §§ 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)				
APPN. SERIAL NO.	COUNTRY	DATE FILED (MM/DD/YYYY)	PRIORITY CLAIM	
			Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

PRIOR PROVISIONAL APPLICATION(S)	
APPN. SERIAL NO.	DATE FILED (MM/DD/YYYY)



# DECLARATION AND POWER OF ATTORNEY

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below:

PRIOR U.S. APPLICATION(S)		
APPN. SERIAL NO.	DATE FILED (MM/DD/YYYY)	STATUS - PATENTED, PENDING, ABANDONED

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## POWER OF ATTORNEY

I hereby appoint Bryan K. Wheelock, Reg. No. 31,441, Joseph E. Walsh, Jr., Reg. No. 36,959, Rudolph A. Telscher, Jr., Reg. No. 36,032, David M. Gryte, Reg. No. 41,809, Evan R. Sotiriou, Reg. No. 46,247, Elizabeth D. Odell, Reg. No. 39,532, Kelly K. Burris, Reg. No. 48,361 and Donald Holland, Reg. No. 35,197, of Harness, Dickey & Pierce, P.L.C., my attorney with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

## CORRESPONDENCE ADDRESS

I request the Patent and Trademark Office to direct all correspondence and telephone calls relative to this application to Harness, Dickey & Pierce, P.L.C., 7700 Bonhomme, Suite 400, St. Louis, Missouri 63105 (314) 726-7500.

Full name of sole or first inventor:

Inventor's signature: Robert Woolley Brunson

Date: 22 APR 01

Residence: 4381 North 125 West, Pleasant View, Utah 84414

Citizenship: US

Mailing Address: Same